Ancient Flutes from Egypt
Author(s): T. Lea Southgate
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ANCIENT FLUTES FROM EGYPT.

In examining and dealing with the fragments of some Flutes found by Professor Garstang during his excavations at the Royal City of Meroë, about fifty miles from Khartoum in the Sûdân, a brief consideration may perhaps be permitted respecting the conditions which obtained at this old Nubian capital on the Upper Nile, so far as they appertain to a phase of music long passed away. It may aid in tracing the origin of these particular flutes, and determining whether they are of local workmanship, or imported.

Kush, an ancient kingdom comprised in Ethiopia, later became one of the dependencies of Egypt proper. From the period of the invasion of Cambyses, B.C. 530, his seizure and destruction of Thebes, the island city of Meroë, decreed by the conqueror to be the capital of the province, became a great trade emporium. Greek influence then began to obtain in the land of the Nile. Although of course the customs, arts, and learning of the more ancient Egyptians extensively prevailed among these more southern people, Meroë was a place of great importance, possessing enough rich and cultured persons to import for use and enjoyment products of art from notable places beyond the Egyptian shores of the Mediterranean.

So much is said in justification of the opinion that, however original and characteristic were the early instruments and music of the Egyptians proper, dating back quite to B.C. 3000, in later times Greece returned to the land of the Pharaohs some of the debt originally incurred with regard to the theory and practice of music when Pythagoras went there and studied the art. We know that this condition was specially the case with the later flutes, and it should be remarked that of old the term 'Flute' was applied to all instruments of the pipe family whether played with reeds, or true flue-blown. There was from time immemorial a great demand for flute music for solemn ceremonies and a number of social purposes.

The Nay, cut from the thick strong stalk of the *arundo donax*, the common water-plant of the Nile, is simply a hollow stem open from end to end, and pierced with a few finger-holes; it has been played in Egypt for thousands of years. This nay is the origin of the entire flute tribe, also of all the *flue* pipes of the organ; the venerable instrument is still played in Cairo. Almost as old is the Zammah in which pipe the arghool (striking) reed is inserted. It is the origin of our clarinet; when the reed is made with double sides it appertains to the oboe family. The transverse flute

came early into use; whether this is to be regarded as the true πλαγίαυλος of the Greeks, or whether this designation referred to another type need not be critically discussed. Although few examples are extant there are specimens recovered from the ashes of Pompeii, and the British Museum presents an example obtained from Halicarnassus to which later reference will be made. Besides the statements of Herodotus, Strabo, Diodorus Siculus, Plato, Lucian, and Pliny, who tell us much about Egypt, its arts and music, a number of Greek writers describe the prowess of their native flute players. The professional *αὐλητραί* and tibicines were esteemed and highly paid artists, indeed some had statues erected to them following their success in public competitions. As the instrument and its capabilities developed, many of those produced became works of constructive skill and artistic ornamentation, fetching enormous prices. Lucian says that Ismenias of Thebes gave a sum equal to a thousand pounds for a flute at Corinth. Lamia so fascinated her admirers that a temple was erected and divine honours paid to the felicitous flautist. Not only are the names of some of the renowned players preserved, but those of celebrated makers have been recorded, as that of Theodorus mentioned by Plutarch.

The four flutes discovered at Pompeii, now in the Naples Museum, arrest attention in connexion with the recent Meroë find, inasmuch as some identical features are presented, features associated with no other specimens remaining, viz., the revolving rings or broad bands for temporarily closing the finger-holes of notes not wanted in the particular piece about to be played. These Pompeian relics have an inner tube of ivory covered by a bronze exterior; the ventages number from eleven to thirteen. As we do not possess enough fingers to close all these holes (in order to obtain the fundamental or lowest note of the tube) some method of applying artificial fingers had to be contrived. The invention of such a device is ascribed by Pausanias to Pronomus, a Theban. This consists in placing over the ivory lining a number of sliding or revolving rings which could be turned round at will. The inventor claimed that by this mechanical device he could play in any of the principal modes on a single flute, instead of requiring specially constructed instruments for each particular scale. It was an ingenious thought, anticipating the spring pad key in use in to-day's wood-wind instruments; this latter mechanical device came into use in the early sixteenth century. It may be mentioned that, in the four Pompeian flutes, the intervals provided with these closing rings are not the same in all the examples; one possesses six rings. Very remarkable is a ring in one case having a second hole bored at a distance a little lower; it probably yielded an enharmonic interval of a quarter of a tone.

In setting out for inspection these Meroë fragments by ranging them on slender wooden rods fastened to a side frame, it must be understood that no attempt has been made to piece them together as they originally existed. We are not sure as to the length of this type of flute, and a glance at the diameters of the pieces will show that they belonged to different instruments of varying size. The design has been to mount the portions in a convenient

form for preservation, so that they can be readily seen and identified in the descriptive remarks which follow.

Like the Pompeian find, the materials are ivory and bronze; although buried in the ground for 2000 years, they have to a considerable extent defied destruction. A qualitative analysis of some fragments shews that the main portion of the metal was copper, with a considerable amount of tin, and there were traces of iron, magnesium, and nickel; probably these latter metals were impurities, and not deliberately added to the alloy. No doubt the alert makers and players had found that ivory was superior to the favoured sycamore wood, in that the moisture from the breath of the player did not cause the instrument to swell, a defect inseparable from wooden tubes. The bronze is still singularly hard; though covered with an olive green oxide and earthy incrustations, it is quite difficult to file. The ivory is very brittle, and unless tenderly handled crumbles to a light brown dust. The bores of the ivory tube and that of the outside bronze are quite true rounds, perfect in their lathe turnings, as tested with callipers. The inner ivory, like the bronze covering, must have been made in sections in order to slip on the revolving rings, and provide a socket for the next portion to fit into. In fact the flute was made in joints just as we construct them now for convenience in carrying about. It may be observed that in putting the instrument together, by changing the position of the several pieces, it was possible to alter the disposition of the finger-holes, and so vary the order of the intervals; the instrument might thus be arranged to suit some particular mode. Judging from the slightly conical outlet pieces preserved, the Meroë fragments indicate five instruments, but there may have been more now broken up and perished. The pieces vary from three and a half inches to under an inch in length. In several examples the round clean cut ends shew that such was the original form, strengthening the impression that each section was designed to fit on to another; certainly the flutes were not made in one piece as were the more ancient instruments. The inner bores, still intact, are from seven-sixteenths to ten-sixteenths of an inch; the bronze covering is of course adapted to fit the varying ivory lining.

The finger-holes are of three types, first round, measuring five-sixteenths to seven-sixteenths; secondly, rectangular oblong, five-sixteenths long by two-sixteenths to four-sixteenths in breadth; thirdly, in an ivory fragment a curved hole having the form of a comma stop in printing; it is eight-sixteenths long, and three-sixteenths at the rounder head, the other end of it comes to a sharp point as the bottom of a comma. Both rectangular and round holes are not found in the same pieces. It would thus seem that there were two main types of finger-holes, but without possessing a perfect instrument for inspection, this cannot be determined, nor is it quite clear what was the distinction in effect between round and squared holes—unless the latter could be more easily half stopped to produce either large or small intervals. In old hautboys can be seen two small holes drilled parallel for the finger to close both, or only one, for chromatic intervals.

What is the chief and remarkable feature in these particular flutes is

the evidence of the revolving ring turning on the tubes; this may be identified on several of the fragments by the small pyramidal-shaped projections or lugs by which these rings could be readily turned. The rings ran loose on slightly grooved reductions made upon the surface of the ivory lining. Their office was to close the finger-hole of a note not wanted for use and foreign to the scale or mode of the piece intended to be played. When the hole in the ring and that in the ivory body of the flute corresponded, the note provided was available for the player's finger. But when he had to perform, or perhaps was actually playing in a piece in which this particular interval was not used, he turned the ring partly round, and shut off the hole; thus a finger was free to be used elsewhere. It is clear that this ingenious piece of mechanism made the flute more useful for general purposes. The action anticipated that of the slider working in an organ soundboard. When the stop controlling this is drawn, the hole in the table of the wind-chest and that of the slider coincide; on the player putting down a key, the pallet is opened and wind passes up to the super-imposed pipe. Much the same plan was adopted in the Hydraulus organ of the Romans.

On consideration of what has been said, and a glance at the mounted Meroë flute fragments (or photograph) the conclusion come to must be that, thanks to the Liverpool University Institute of Archaeology, with congratulations to Professor Garstang on his successful exploration, we have obtained for England specimens of the exceedingly rare Bombyx flutes of the ancients.

This is not the occasion to enter into a description of the Greek scales system (modal we now term it) each of them with its individual succession of intervals; nor the development of the diatonic, chromatic, and enharmonic scales from the ancient pentatonic form. Nor to discourse on the employment of the tetrachordal method of building up a ladder of sounds in which the tonic appears in the middle of the scale, not at the bottom as with us; nor the intonation and treatment of the complex Pythagorean fourth, an interval subject to alteration. It is enough to observe that each of the Greek modes presented a character of its own incidental to the order of scalar intervals. According to the succession in which the notes were placed in their vocal music, so the design was to reproduce just those required, and no more, on the flute, when that popular instrument was used to play with and reinforce the voice. Various were the tone qualities and many were the names attached to the old Greek flutes. On sculptures and early illustrations will be noticed pipes having projections along the top. There is little doubt that these represented plugs placed in the finger-holes to stop-off notes not then needed; they could be taken out and readily replaced. It was a stroke of genius on the part of the Theban musician, circa B.C. 300, to invent the ring system and thus, as he boasted, to play on the same instrument music in the Lydian, Dorian and Phrygian modes. The rings running round the surface of the flute together with the little lug projections gave the instrument the appearance of a silkworm with its short legs; hence the designation *βόμβυξ*.

It will be asked, 'How were these flutes blown?' a question that cannot be absolutely determined. They could hardly be lip blown by the breath across the open top, as was the ancient Egyptian Nay—the diameter of the orifice appears too small for that method of sound production. The notes could have been evoked by the use of a vibrating reed put into the mouth end, or inserted sideways in the tube, as is seen in some sculptures. But there is another method of making them speak, viz., from a mouth-hole bored in the side, in fact, much as takes place now through the embouchure of the transverse flute.

It has been asserted that the side-blown flute is of comparatively modern invention, indeed that Germany of the sixteenth century is the place of its origin. Not so. On two of the splendid marble Topes in India are to be found representations of players with the side-blown flutes—*vide* Rawlinson's 'Tree and Serpent worship.' One of these monuments dates before Christ, the other early in the Christian era.

But we have still older evidence. Mr. Christopher Welch in his erudite and most valuable work on the flute tribe, *The Recorder* (1911, Froude), calls attention to an exhibit in the Room of Greek Roman Life at the British Museum. Here can be seen fragments, put together, of a flute found in a grave at Vistalik, Halicarnassus, by Sir Charles Newton during the time of the Crimean War. It is depicted and described at page 248 of Mr. Welch's book. The inner tube is of ivory with an outer casing of bronze; unfortunately little of the original remains. It seems to have been made in portions, either slid in over the ivory lining, or the sections socketed together. Impossible to say if the sections were movable the surface being throughout on one level, rings certainly could not slide up and down over the ivory; there is no indication of the convenient lugs. Towards the end is placed an ivory mouth-piece slightly raised above the body of the tube, and possessing a rounded hole by which the instrument was blown; the device and mode of playing is almost identical with to-day's transverse flute. The length of the instrument as now put together is twelve inches; its original length is uncertain.

On the shelf at the side of this Greek relic are two flutes in fair preservation, No. 522, from the Castellani Collection. They are of bronze and appear to have an ivory lining. Here again it may be noted they have been made in sections; whether any of these are independent portions intended to turn round and so operate on holes beneath cannot be determined owing to the encrusted condition of the instrument. There are no signs of lugs on the bronze covering. Each flute has five finger-holes; like the Halicarnassus example they have superimposed on the top a mouth-piece, here of bronze representing the head and bust of a reclining Maenad. The mouth-end of one tube is stopped, the other is broken and cannot be determined. They are labelled 'A Pair of Reed Pipes.' Although a small reed cut in its original matrix could be inserted in this hole, it is pretty certain that it could also serve as a direct mouth embouchure. However, in any case the pipe must have been held sideways to play.

Here then are preserved specimens of the πλαγίαυλος family of flutes, a type often mentioned by the classical authors. Caspar Bartholinus in his elaborate and interesting work *De Tibiis Veterum* (Amsterdam, 1679) says that players on the plagiaulos 'modos vocis regebant,' indicating a method of governing the modes. He also states that the Bombyx was the longest of the flutes, quoting Aristotle and Pliny, who declare it was the most difficult to fill with breath, which would doubtless be correct if a reed was used. Quintilianus writing of this tibia speaks of the adjustable finger-holes 'Foramina alium clausis alium apertis.' Cicero alludes to the changing keys in 'Quam varios canendi modos.' Hesychius, a late Alexandrian writer, mentions the 'Pars tibiae quae ad os admovetur.' And Pollux declares they were played with 'arundinis foeminae specie.' Was this the single beating reed of the old Zammah, in distinction to the later double reed of the oboe type?

Mr. Welch in his book, p. 209, prints a passage in Greek from Arcadius quoted by Salmatius, *Exer. Plin.* 84, of some significance as to the adjusting of the movable metal encircling bands. The text is somewhat obscure, but it may be gathered that the closing rings could be slid round the surface; the employment of the word στρέφοντες distinctly indicates that they could be turned round. These citations are suggestive. Whether the Meroë flutes were played from a side hole, and without a reed, cannot positively be determined. We might know better if we were certain as to the true length of the instrument; there is a limit to satisfactory note production in small tubes blown from a side embouchure. In all probability these flutes were reed blown.

The four flutes recovered from Pompeii, now reposing in the Museum at Naples, supply a measure of evidence worth consideration; it is apparent that their construction closely approximates to that of the Meroë examples. They have an inner tube of ivory with a bronze casing, and what is more important, they are furnished with the revolving rings, here believed to be of silver. If a reed had been inserted in the bulb-shaped mouth end, this, being a fragile tongue of wood, has perished in the long centuries while it lay after the eruption of Vesuvius. The length of these flutes is given as twenty-six inches; with their small bore (three-eighths) it would be very difficult to produce notes of any strength of tone. But with a reed, especially a double reed, it would be as easy as to play the teneroon—an old bassoon an octave above our bass orchestral instrument. The lowest note obtained would depend upon the stiffness and length of the reed employed in conjunction with the column of air set in vibration. If a reed was used, then the Meroë flutes would fall into the category of the oboe family. Pliny speaks of the instrument as possessing 'lingulas (*i.e.* tongues or speaking reeds) et foramina' (holes). There is a remarkable passage in Horace which perhaps affords some clue:—*Ars Poetica*, l. 202–5, 'Tibia non, ut nunc, orichalco vincta, tubaeque Aemula; sed tenuis simplexque foramine pauco Adspirare et adesse choris erat utilis.'—'The flute was not, as now, bound with (hard ?) brass, and rivalling the trumpet; but being small and plain

was useful to blow with its few holes to assist the chorus.' This comment on the distinction between the old soft simple flute, and the (then) modern one bound with metal, striving to imitate the tone of a trumpet, is indeed significant. To some extent this stridency would result from the employment of a reed, and a considerable breath force. Well might the players need the use of a *capistrum* band to protect their cheeks from the internal breath pressure. After certain experiments with an arghool reed it was the settled opinion of Monsieur C. V. Mahillon, the well-known Belgian instrument maker, connected with the Brussels Music Museum, that a broad double reed was used with the Pompeian flutes; his conclusion has not been controverted. Incidentally it may be observed that, considering the great length of this set of instruments in the case of the one possessing fifteen finger-holes, and apparently furnished with five closing rings, owing to the distant spread of the holes, it must have been very difficult to reach and stop all when required to be closed by the fingers. In the Museum of the Capitol at Rome is a mosaic of the imperial period representing a tragic masque; the players have flutes like those found at Pompeii, seemingly furnished with double reeds. The mosaic was found in 1828 in the course of some excavations on the Mount Aveetin.

Corinth was the city where the best and most artistic flutes were made, but Alexandria ran it close for fame. No slight combinative skill was displayed in the planning, gauging the bores, and putting together the flutes; the ornamentation, inlaying, and finish of the instruments seems to have been as fine in its way as was the work of the Italian lute makers of the seventeenth century. There are many records of the high esteem in which these Greek productions were held, and of the enormous prices paid for them. If there were any good local Meroë players, as apart from the Greek immigrants invited to go to the luxurious city to exhibit their skill, it is very unlikely that they could obtain instruments of this advanced character; they would probably be content with their home manufacture. The visiting musicians were doubtless Greeks, the theorists of which land had perfected the older Egyptian musical system, and the craftsmen were skilled instrument makers; of course they brought their favourite flutes to the Upper Nile city.

The fragments of the five examples shown in the frame (Fig. 1) are placed together to make up an uniform length of about ten inches. What are believed to be their outlets, rounded conical slightly bell-shaped pieces, are put to the right.

No. 1 consists of five pieces. There is one large round hole in the second portion, and two smaller in the next; some of the ivory lining still remains attached. There are no holes in the next portion but a slight crack will be observed running along the top; this may indicate that the method of construction was to bend round and join up lengthways the pieces of the bronze covering.

No. 2. A similar break is seen in the first portion of this example. The reduction of diameter at the left end may indicate that it was intended for

a turning ring to be worked here. The next portion discloses in its middle the ivory lining intact; as it shows no finger-hole, it must be looked upon as a socket-joint to unite two portions of the flute. The conical outlet follows.

No. 3 consists of six pieces of much importance. On the surfaces of the first, second, third and fifth pieces will be seen inverted Λ-shaped protuberances. These are the lugs or ears fastened to the tops of the revolving rings; they form a sort of boss for the fingers to grasp and so turn easily when required to shut off a note not wanted; the closed dome-shaped

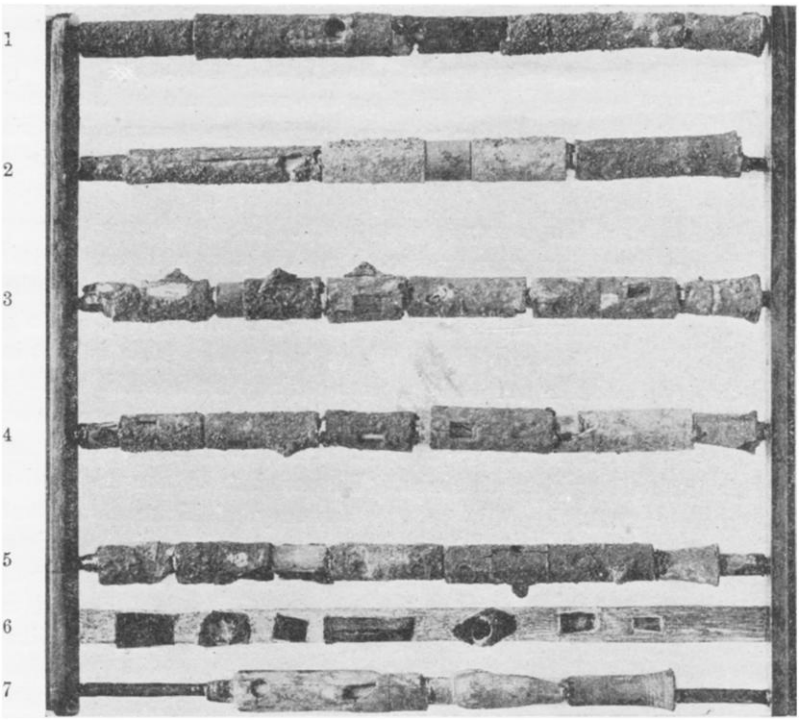

FIG. 1.—FRAGMENTS OF FLUTES FROM MEROË.

spring-keys on our wind instruments now serve an identical purpose. It may be mentioned that in certain of the brass instruments of Austrian bands circular valves are employed instead of pistons or sliders. It will be noticed that in this example some of the holes are rectangular, and that they differ in size, as do the round holes. The inference is that the Greek makers well recognized the necessity of true intonation, perceiving that on the precise size of the ventages depended the tonal accuracy of the notes produced. The larger the hole, the sharper or higher was the note; this method of graduation secured just intonation, on which the Greek theorists laid great stress. Holes in the first and fifth pieces remain open. The others are closed.

No. 4 consists of five pieces. On the first are found two lugs with rings, though not in line; the first has its squared hole uncovered. Then comes a joint followed by another larger hole that must have remained open always; beyond that is the second lug with its ring hole covered up. The next two portions exhibit squared holes open, they are of different sizes. Then is placed a piece with a portion of the ivory connecting joint still remaining.

No. 5 consists of five pieces. The first shews trace of a lug broken off. The next displays quite a long piece of its ivory lining. The third exhibits on its face two small round holes; perhaps the corresponding holes are in the ivory beneath, but the rings have got turned round and will no longer work, so these under-holes do not appear. The fourth and fifth portions now attached together have each a lug on them, one round hole in the bronze is in advance of this; running from it is a longitudinal crack. The ringed formation is here very clear, the respective round finger-holes remain open just opposite the lugs.

No. 7 consists of fragments of ivory only. If these ever possessed a bronze exterior it has disappeared; there is certainly a green metal stain on the socket of the first piece. Here is a round finger-hole, and then a remarkable ventage somewhat in the form of a comma stop (❟). If a guess may be made as to the purpose of this curiously shaped hole, it is that it was intended to serve a double purpose. If left entirely unclosed, it would yield a whole tone note; by graduating the surface covered (more easy to accomplish than with round or squared vents) a semitone or a smaller enharmonic interval could be obtained. The remarkable eleven-holed short reed-blown flute found in 1888 in the cemetery of Akhmin, the ancient Panopolis, was furnished with an ingenious method for obtaining this small interval, certainly used by the Egyptians long before the time of the Greek civilization. There is an enlightening passage in the old French writer Solomon de Caus (1614) as to skilled players covering the holes little by little :—' Peuvent les hauser ou baiser à leur plaisir par le moyen des doibs (*sic*) qui bouchent lesdits trous peu à peu.' It seems that this method of change of note, and 'justness' has obtained from time immemorial. To-day our players obtain small differences of intonation by the manipulation of their lips. Old hautboys had for use two small holes side by side, instead of one large one for use as required. The next piece on the rail is a piece of ivory neatly graduated to a curve; the outlet with some slight ring marks cut round it complete the examples on this rod.

On the lower cross rail of the frame (No. 6) are placed three fragments of the bronze, the incrustation partly filed off to shew the bronze surface. Then a piece of a smaller pipe with the jointure slit shewing; a broken little section of the flute disclosing its ivory lining; finally two fragments of the ivory, one stained green by the metal that had been above it, the other now cleaned.

It should be pointed out that the lugs have small pin-holes through the top. Was this to enable them to be fastened together by tying to a rod

running along, so that all the closing rings could be turned at the same time?

The little wooden frame on which the pieces are strung is deposited in the Museum of the Institute of Archaeology attached to the University of Liverpool.

There seems every probability that the flutes, which these relics represent, belonged to a Greek artist bringing with him for performance at Meroë his own improved and esteemed instruments. They are not likely to have been made locally.

The possession of these most interesting fragments from Meroë, recovered from the soil of the oldest of the civilizations, if it does not add a fresh full chapter to the historical account of the flute family, yet supplies valuable evidence of an important development in the descent of that delightful and most ancient instrument.

T. Lea Southgate.